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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,068	01/29/2002	Ubaldo Mastromatteo	854063.670	8416

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EXAMINER
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RAO, SHRINIVAS H

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/060,068

Applicant(s)

MASTROMATTEO, UBALDO

Examiner

Steven H. Rao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 July 2005.  
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-20, 27-33, 35-40 and 55-66 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☐ Claim(s) 13-20, 27-33, 35-40 & 55-66 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_  
 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_  
 5) ☐ Notice of Informal Patent Application (PTO-152)  
 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

Acknowledgement is made of papers received on July 19, 2005 entered on July 27, 2005 claiming priority under 37 CFR 1.114 from U.S. Serial No. 10/060068 filed on January 29, 2002 which itself claims priority from Italian Patent Application No. TO2001A000086 filed on January 30, 2001, all of the above papers have made of record in the file.

### ***Claim Rejections - 35 USC Section 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-18, 27-30, 55-58 ,60-62 and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by Chao et al. ( U.S. Patent .NO. 5,633,535 herein after Chao).

With respect to claims 13, 27, 55 Chao describes a device forming an electromechanical or optical micro system, the device comprising :a first body of semiconductor material ( Chao 10) and a second body welded together through a mechanical and electrical connection structure, the mechanical and electrical connections structure ( Chao 20 ) comprising: an electrically conductive region welded between said first body ( Chao fig. 5 # 42 conductive region, # 10 -first body) and said

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second body ( fig. 5 # 20 -second body) ; and a unitary spacer region arranged near said electrically conductive region and extending between first and second bodies (Chao fig. 6 # 40 extending between 10 and 20, fig. 5 # 40, col. 4 line 33) the spacer region including a completely enclosed first cavity surrounding an active region of the electromechanical or optical micro system (defining an enclosed space between the first and second bodies ) ( or surrounding more than half of an active region, or at least two contiguous sides of an active region) ( or surrounding at least three sides an active region) ( Chao figs. 6-8 etc. 40 defining enclosed space between them ).

With respect to claims 14 , 28 and 58 Chao describes the device according to claim 13,27 and 55 wherein said electrically conductive region is of a low-melting eutectic material. With respect to claims 15 and 59 describes the device according to claim 14, 58 wherein said low-melting eutectic material is formed by alternating layers of gold and tin.

With respect to claims 16 and 60 Chao describes the device according to claim 13, 55 wherein said spacing region is of dielectric material. ( Chao col. 4 lines 40 to 65)

With respect to claim 17 and 61 Chao describes the device according to claim 16, 55 wherein said dielectric material is chosen from among a spun polymer, such as SUB, polyimide, a composite material formed by laminated polymer layers, such as a photosensitive stick foil, and oxynitrides. ( Chao col. 66-67).

With respect to claims 18 and 56 –57 Chao describes the device according to claim 13, 55 wherein said spacing region forms a completely enclosed second cavity surrounding said electrically conductive region. ( Chao figure 6, etc.)

With respect to claim 29 Chao describes the device of claim 27 wherein the first and second metal regions and the connection structure are formed within the first cavity defined by the spacer . ( Chao figure 6, etc., 42 metal regions and connection structure 43 are formed within space defined by spacers 40 ).

With respect to claim 30 describes the device of claim 27 wherein the spacer further defines a completely enclosed second cavity between the first and second bodies , the device further comprising a micromechanical structure formed within the second cavity defined by the spacer . ( Chao figures 4 A and B, 6 etc. different bodies defined by different spacers 40 , pad of substrate having printed circuit board).

Claim 62 wherein the active region comprises a suspended electro mechanical structure ( Chao figures).

Claim 65 wherein the device of claim 55 further comprises a third body welded to the first body and adjacent to the second body, and spacer region extending between the first and third bodies and including a completely enclosed second cavity that surrounds an additional active region of the microsystem ( Chao figures 4 etc. ).

### ***Claim Rejections - 35 USC # 1 03***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19-20 and 31, 59, 63-64 and 66 are rejected under 35 U.S. C. 103 over Chao et al. ( U.S. Patent No. 5,633,535, herein after Chao) as applied to claims 13-18 , etc. above and further in view of Yew et al. ( U.S. Patent No. 6, 137,164, herein after Yew).

With respect to claim 19, Chao describes the device according to claim 13. Chao does not specifically describe the device comprising a metal region which extends on top of said second body and beneath said electrically conductive region. However Yew in figures 5,8 etc. describes metal regions extending on top of second body and beneath the electrically conductive region to form interconnections to perimeter vias for a first and second integrated chip of different sizes and functions and to form self aligned plural bodies during bonding.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Yew's metal regions extending on top of second body and beneath the electrically conductive region in Chao's device So form interconnections to the perimeter vias for a first and second integrated chip of different sizes and functions and to form self aligned plural bodies during bonding. ( yew col. 4 lines 8 to 15).

With respect to claim 20,59 describes the device according to claim 19, wherein said welding region and said metal region are of a material chosen from among titanium, gold and nickel. (well known in the art).

With respect to claim 31 describes the device of claim 27 wherein the first body

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of semiconductor material is formed of quartz. ( well known in the art).

**B.** Claims 32-33, 35-38, 39-40, are rejected under 35 U.S. C. 103 over Chao et al. ( U.S. Patent No. 5,633,535, herein after Chao) and Yew et al. ( U.S. Patent No. 6,137,164,

herein after Yew) as applied to the claims above and further in view of Duboz et al. ( U.S. Patent No. 5,726, 500 herein after Duboz).

With respect to claim 32 Chao and Yew describe the device of claim 31 Chao and Yew do not specifically describe the device further comprising a mirror formed on a second surface of the first body.

However Duboz in col.4 lines 29-32, etc. describes the device further comprising a mirror formed on a second surface of the first body as pad of the photo sensitive element of the photodiode when the electronic circuit forms a part of an infrared detector, etc.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Duboz's device including the mirror in Chao and Yew's device to form the photo sensitive element of the photodiode when the electronic circuit forms a pad of an infrared detector, etc. ( Duboz col. 4 lines 29-32, col. 5 lines 45-50).

With respect to claims 33 describes the device of claim 31, further comprising a diffractive lens formed on the second surface of the first body. ( Duboz col. 5 lines 10-17 ) .

With respect to claims 33, 35-36, and 63 Chao describes the device of claim 31

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wherein it comprises an electromechanical (Chao 42), fluid (Duboz col. 5 lines 10-17). and optical system (Duboz in col.4 lines 29-32).

With respect to claim 37, Chao describes the device of claim 36, further comprising a mirror formed on a surface of the first body opposite the optical structure. ( Duboz col. 4 lines 29-32) .

With respect to Claim 38, Chao describes the device of claim 36 , further comprising a third body ( Chao figures 4 5, third 42 ) welded to first body ( welded to 10) adjacent to the second body ( 42 adjacent to second 42) and a spacing region formed between the first and third bodies and surrounding an additional active region. (figures 4 5 ) .

With respect to claim 39 the device of claim 38 further comprising first and second mirrors formed on opposite faces of the first body. (Duboz figure 5 )

With respect to claims 40 and 66, Chao describes the device of claim 13, 55 wherein the first and second bodies are wafers of semiconductor material. ( Duboz figure 1 10-GaAs, Is-silicon).

With respect to claims 63 and 64 wherein the light producing component is a LED (Duuboz col. 5 line 49, etc.) .

#### ***Response to Arguments***

Applicant's arguments filed 07/27/2005 have been fully considered but they are not persuasive. for the following reasons :

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically



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pointing out how the language of the claims patentably distinguishes them from the references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is ( 571)272-1718. The examiner can normally be reached on 8.00 to 5.00.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

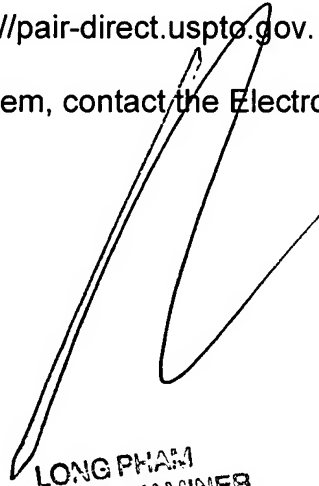
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Steven H. Rao

Patent Examiner

September 29, 2005.



LONG PHAM  
PRIMARY EXAMINER